

LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES



**OFFICE OF FISHERIES
INLAND FISHERIES SECTION**

**PART VI -B
WATERBODY MANAGEMENT PLAN SERIES**

CALCASIEU RIVER

**WATERBODY EVALUATION AND
RECOMMENDATIONS**

CHRONOLOGY

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WATERBODY EVALUATION

STRATEGY STATEMENT

Recreational

Black basses, crappies and catfishes are managed in the Calcasieu River to provide sustainable populations of fish while giving anglers the greatest opportunity to catch and harvest a limit of fish. Sunfishes are managed to provide a sustainable population while providing anglers the opportunity to catch and harvest numbers of fish.

Commercial

Commercial species are managed with statewide regulations to provide a maximum sustainable yield that does not contribute to declines in future population strength.

Species of Special Concern

The following fish species are listed as species of conservation concern in LDWF's State Wildlife Action Plan (Lester et al. 2005):

Paddlefish, *Polyodon spathula*
Western Sand Darter, *Ammocrypta clara*
Bigscale Logperch, *Percina macrolepida*

The recreational harvest of paddlefish, *Polyodon spathula*, provides that two individual fish may be harvested recreationally if not exceeding 30 inches lower jaw – fork length. Paddlefish greater than 30 inches must be returned immediately to the water. Taking or possessing paddlefish in all saltwater areas of the state is prohibited. All possessed paddlefish must be dead. The possession and transportation of live paddlefish is prohibited. All paddlefish possessed on the waters of the state shall be maintained intact. No person shall possess paddlefish eggs on the waters of the state which are not fully attached to the fish. The commercial harvest of paddlefish is prohibited.

EXISTING HARVEST REGULATIONS

Recreational

Statewide regulations are in effect for all species:

Crappie - 50 daily per person, no size restrictions

Sunfish (Bluegill, Redear, etc.) – no daily limit or size restrictions

Largemouth Bass – 10 daily per person, no size restrictions

Yellow Bass – 50 daily per person, no size restrictions

Bowfin (Choupique) – 16 inch minimum total length

Freshwater Drum (Gaspergou) – 12 inch minimum total length, 25/day.

Buffalo – 16 inch minimum total length, 25/day.

Shad – 50 pounds daily.

Crawfish – 150 pounds daily.

Paddlefish – two incidentally caught fish less than 30 inches lower jaw – fork length may be possessed dead and intact while on the waters of the state except for the saltwater areas of the state

**Channel catfish* – 11 inch minimum length

**Blue catfish* – 12 inch minimum length

**Flathead catfish* – 14 inch minimum length

*Catfish (blue, channel and flathead): The possession limit for catfish caught recreationally shall be 100. The 100 fish may be a single species, or a combination of blue, channel or flathead catfish. A recreational fisherman may possess a maximum of 25 undersize catfish of a single or combination of all three species within the 100 fish possession limit.

Commercial

Statewide regulations are in effect for all species:

Blue catfish– 12 inches minimum length limit, no limit

Channel catfish– 11 inches minimum total length limit, no limit

Flathead catfish– 14 inches minimum total length limit, no limit

Buffalo– 16 inches total length limit, no limit

Freshwater drum– 12 inches minimum total length limit, no limit

Bowfin-- 22 inches minimum total length limit, no limit. Fishermen are prohibited, while on the water, from possessing bowfin eggs (roe) that are not naturally connected to a whole fish. The taking of bowfin or bowfin body parts with nets, including eggs (roe), is prohibited during the months of December, January and February.

Crawfish – No limit

Gill nets, seines, and trammel nets are prohibited below the Intracoastal Waterway (designated saltwater zone).

SPECIES EVALUATION

Recreational

Largemouth bass

Largemouth bass (LMB) are managed with statewide length and creel limits (see above), and make up over 90% of the population of black bass on the middle river section. LDWF standardized sampling for game fish occurs in this section, the results of which will be discussed below. Further upstream, as the river habitat changes, black bass populations gradually shift to predominately spotted bass.

Size distribution, relative weight and relative abundance-

Length distributions generated from standardized sampling show the majority of LMB (85.7%) in the Calcasieu River are less than 11" total length (TL) as depicted in Figure 1. This may be partially attributable to the variable nature of river systems where spring flood pulses provide abundant spawning habitat, leading to an excess of young fish annually that cannot be supported in fall low water conditions. Other possible contributing factors include station location bias, gear bias, fishing pressure, and hurricane Rita recovery (2006) where 99% of LMB captured in the fall sample were less than 11" TL. Mean relative weights (Wr) for most inch groups are greater than 90, indicating a healthy population with adequate forage.

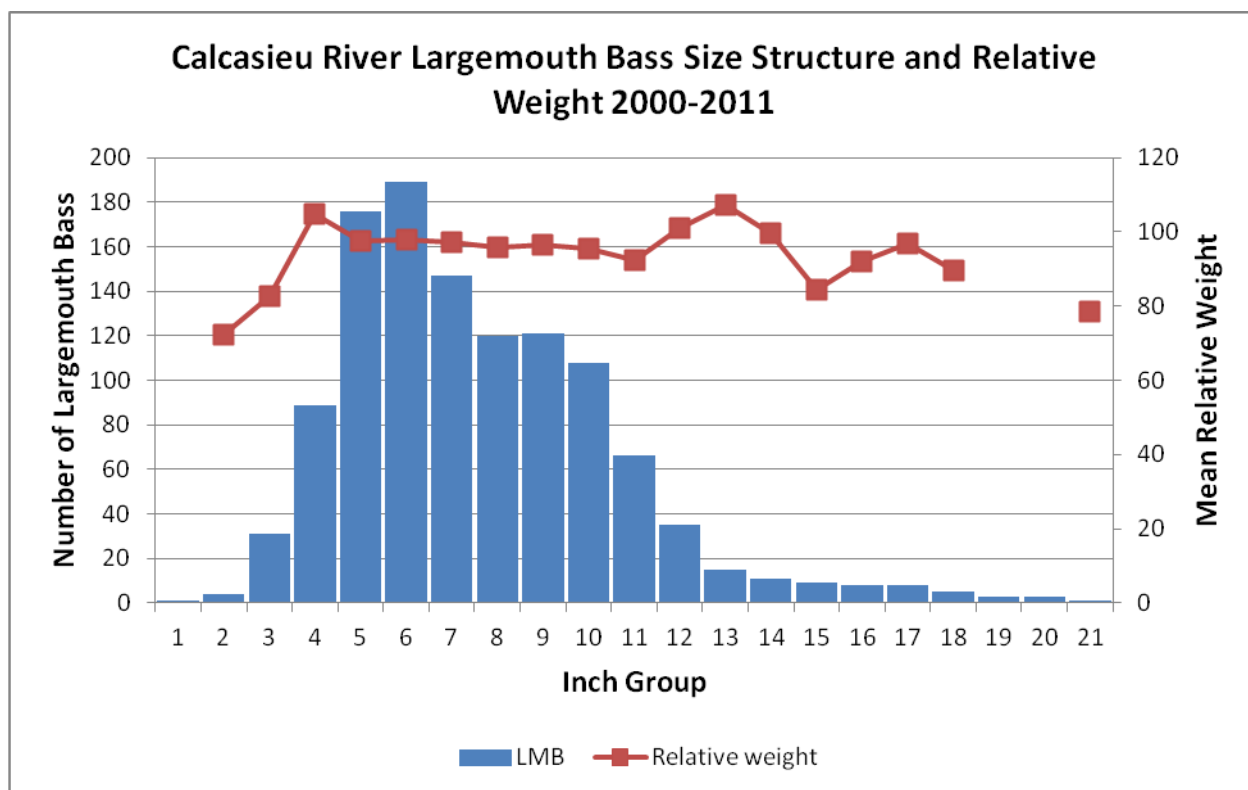


Figure 1. Size distribution and relative weight of largemouth bass generated from standardized electrofishing results for the Calcasieu River 2000-2011 (N=1,150). Mean relative weights generated from fall samples only (N=426).

Standardized spring electrofishing results (Figure 2) indicate a stable population in the 1990's, but lower relative abundance than the late 2000's. The low 2006 CPUE is a result of Hurricane Rita and its associated fish kill in fall of 2005. From 2007 to 2011 samples show increased relative abundance, but greater variability, possibly due to increased abundances after hurricanes, river conditions at time of sample, and/or natural population fluctuations.

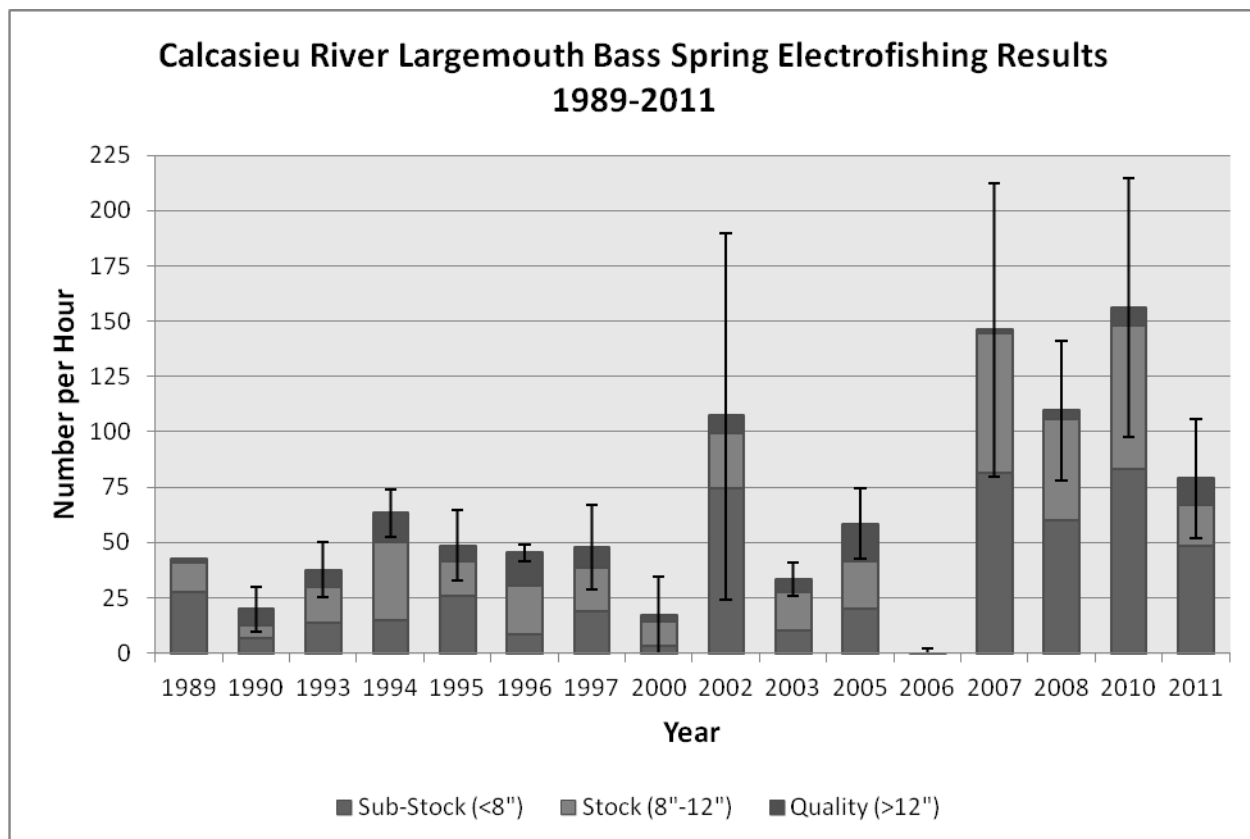


Figure 2. Annual mean CPUE (number per hour) for largemouth bass by size class from standardized spring electrofishing results 1989-2011. Error bars represent standard error of total mean CPUE.

Fall standardized electrofishing samples show high variability, reflecting natural fluctuations in recruitment and population (Figure 3). In fall 2005, no largemouth bass were captured after Hurricane Rita. Population recovery was rapid with record CPUE recorded (116.8 bass/hour) in fall of 2006. A small (13,206) number of northern strain LMB were stocked in spring 2006, however no data is available on the success of this stocking. It is unlikely however, that this number of fingerlings was responsible for the high recruitment recorded for that year.

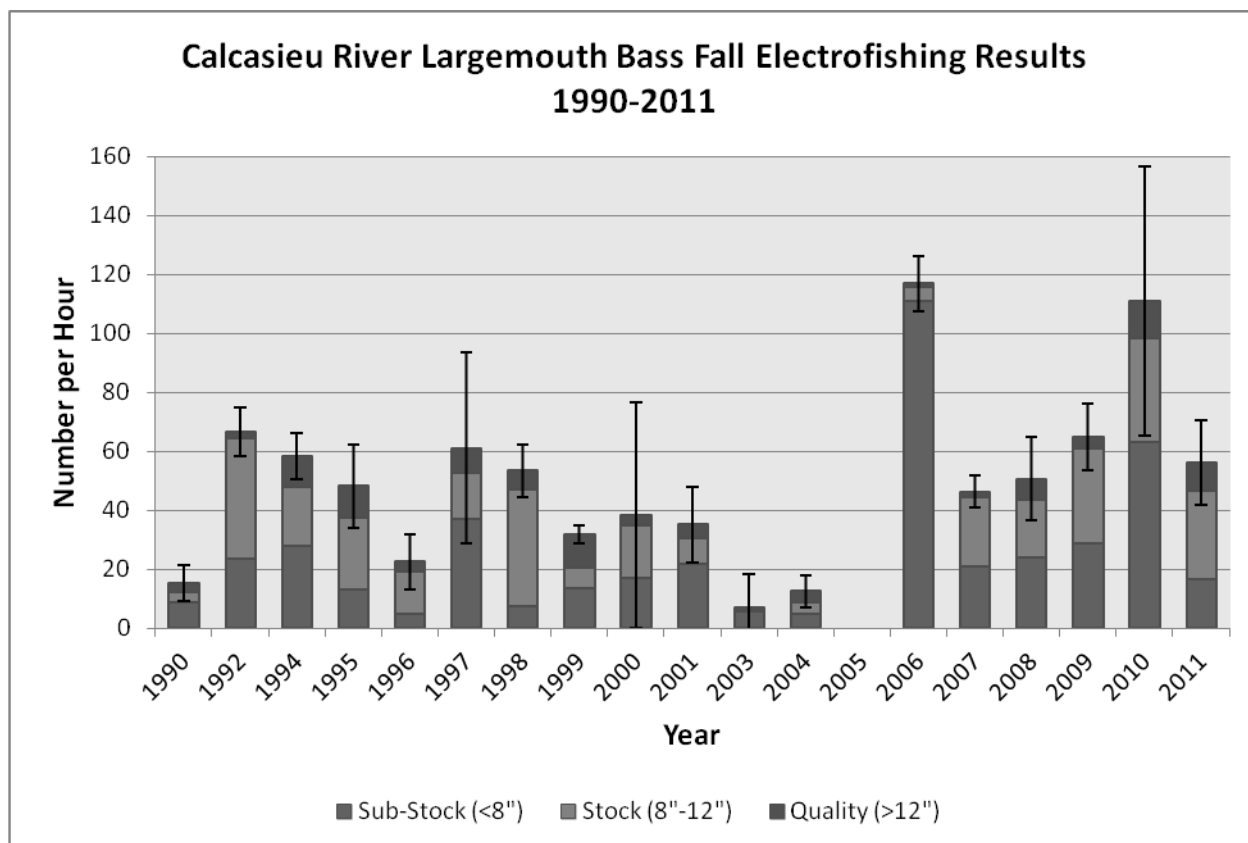


Figure 3. Annual mean CPUE (number per hour) for largemouth bass by size class from standardized fall electrofishing results from 1990-2011. Error bars represent standard error of total mean CPUE. Note the blank in 2005 represents no catch of largemouth bass.

Age and growth-

Age and growth samples were collected in 1990, 2000, and 2007. Because of the small sample sizes collected in 1990 and 2000 (N=28 and 29 respectively), no growth analyses are presented here. In 2007, because of the effects of hurricane Rita, all fish collected (N=44) were age 0 to 1. Because of this lack of older age classes, growth rates from this sample would not be representative of the “normal” age and growth information for the Calcasieu River. In order to collect current, representative, growth information for the river, we will initiate the standardized age/growth/mortality study on the Calcasieu this fall (2012).

Genetics-

No genetic analyses of LMB are available for the Calcasieu River. This information will be collected in conjunction with the standardized age/growth/mortality study beginning this fall (2012).

Spotted bass

In the middle section of the river, spotted bass make up less than 10% of the black bass population. As the river habitat transitions to a shallower, sandy bottom, spotted bass become more abundant until they comprise up to 90% of black bass populations in the upper river (Figure 4). In 2008 and 2009, one of the upper reaches was not sampled in each year. Samples

therefore showed a more even distribution of bass species reflective of habitat transition from the middle to upper sections of the river.

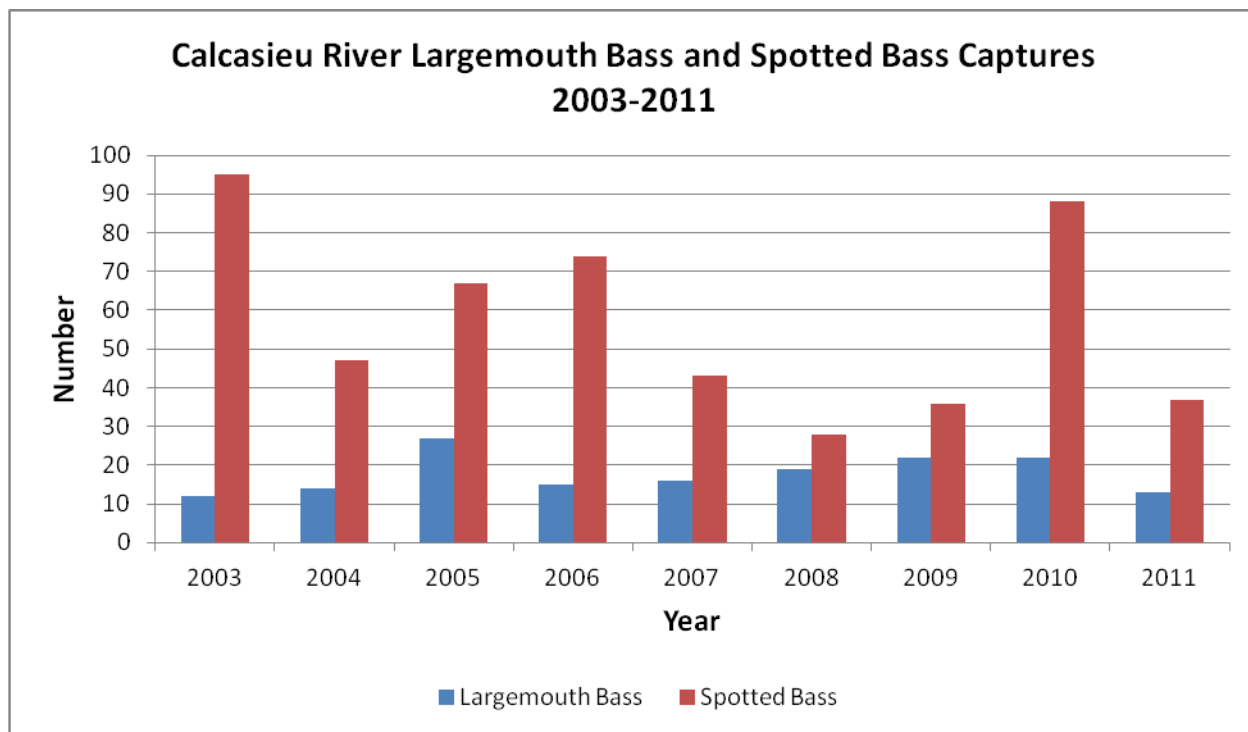


Figure 4. Largemouth bass and spotted bass captured in LDWF standardized big river sampling efforts on the upper Calcasieu River, LA, from 2003-2011 (N=675). Seines and electrofishing gears combined.

Forage

According to standardized electrofishing forage results, the most commonly available forage for largemouth bass in the Calcasieu River are *Lepomis spp.*, primarily bluegill and longear sunfish. Estuarine species such as bay anchovy (*Anchoa mitchilli*) and gulf menhaden (*Brevoortia patronus*) are also readily available forage items whose abundance varies with salinity. Other forage species found in the middle section of the river include freshwater silversides and juvenile spotted suckers. While sampling indicates forage availability varies by year (Figure 5), this may be reflective of sampling bias since standardized forage sampling may not adequately sample pelagic species (shad, anchovies, and menhaden). In 2005, no forage species were collected as a direct result of fish kills associated with Hurricane Rita. In 2011, LDWF forage sampling protocols were changed to attempt to more accurately reflect forage availability by increasing sampling sites while decreasing sampling duration.

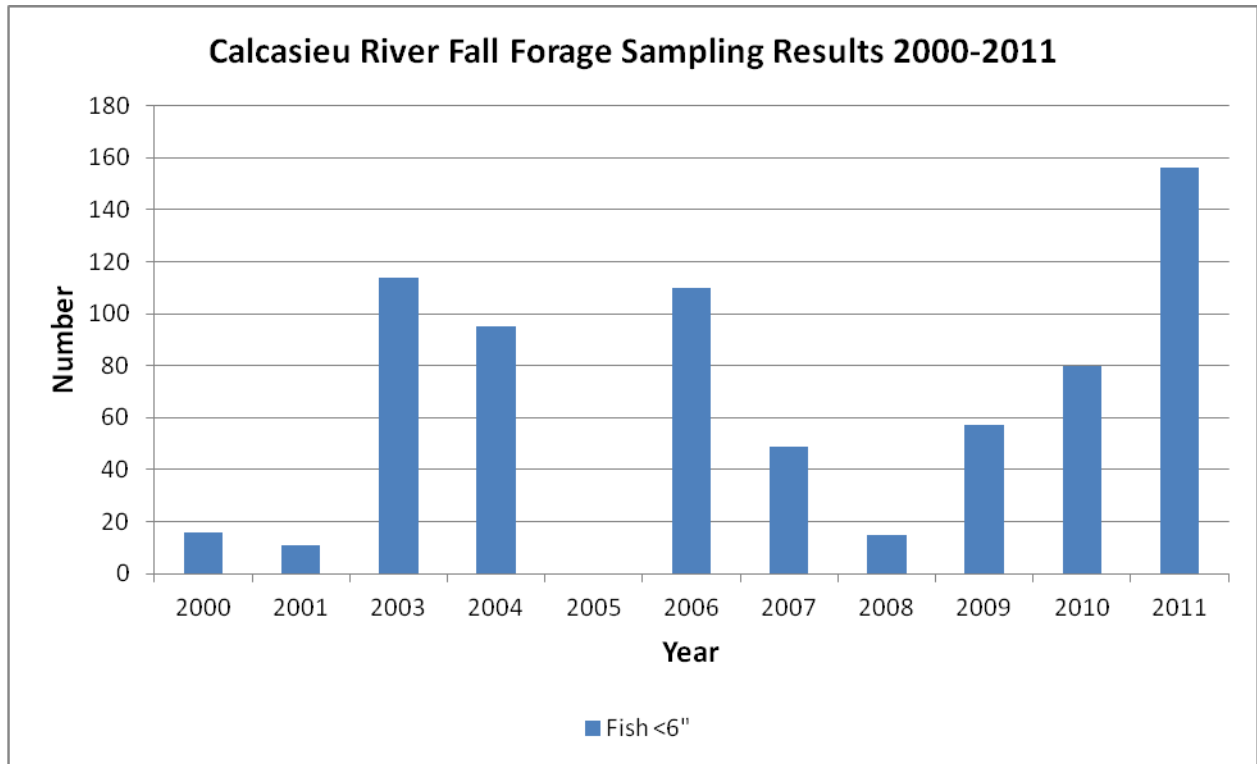


Figure 5. Number fish less than 6" total length (forage fish) collected in LDWF standardized electrofishing forage samples on the Calcasieu River from 2000-2011.

Crappie

Both, black and white crappies are found in the Calcasieu River, with black crappie being more prevalent (Figure 6). No crappie specific sampling has been conducted on the river. The feasibility of using lead nets to sample crappie on the river should be examined.

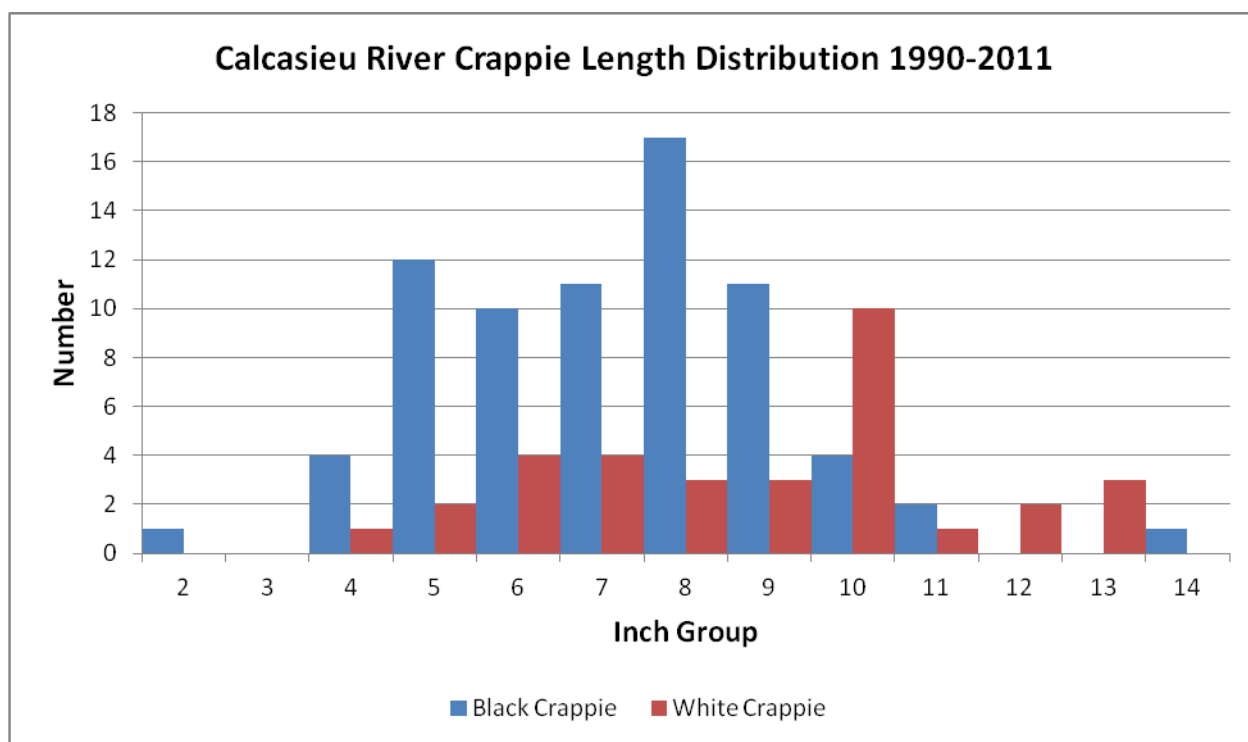


Figure 6. Black crappie and white crappie size distribution (inch groups) generated from standardized electrofishing results on the Calcasieu River, 1990-2011 (N=73 and 33, respectively).

Other Species— In 2002, LDWF initiated standardized big river sampling utilizing multiple gears to develop baseline data on the riverine fish species community. A total of 29,902 individuals were collected representing 77 species from August 2002 to July 2012 (Table 4).

Table 4. Fish species and total number collected in Calcasieu big river sampling efforts from August 2002-July 2012.

Species	Number	Species (continued)	Number
American Eel	1	Hybrid Striped Bass	2
Banded Pygmy Sunfish	1	Hybrid Sunfish	10
Bay Anchovy	146	Largemouth Bass	191
Big Scaled Logperch	24	Longear Sunfish	2017
Black Crappie	28	Longnose Gar	12
Blackside Darter	17	Marsh Killifish	13
Blackspot Shiner	11	Mimic Shiner	1283
Blackspotted Topminnow	643	Mud Darter	1
Blackstripe Topminnow	169	Orangespotted Sunfish	336
Blacktail Redhorse	130	Paddlefish	16
Blacktail Shiner	8057	Pallid Shiner	743
Blue Catfish	20	Pugnose Shiner	23
Bluegill	589	Red Shiner	1

Bluntnose Darter	33	Redear Sunfish	23
Bowfin	5	Redfin Shiner	27
Bream	1	Redspotted Sunfish	102
Brook Silverside	889	Ribbon Shiner	509
Brown Madtom	1	River Shrimp	23
Bullhead	1	Sabine Shiner	278
Bullhead Minnow	2577	Scaly Sand Darter	466
Carp	3	Sea Catfish	1
Chain Pickerel	1	Shortnose Gar	1
Channel Catfish	51	Silvery Minnow	31
Crawfish	36	Skipjack Herring	1
Creole Darter	1	Slough Darter	1
Dollar Sunfish	43	Smallmouth Buffalo	75
Dusky Darter	61	Southern Brook Lamprey	1
Emerald Shiner	103	Speckled Chub	4
Flathead Catfish	70	Spotted Bass	545
Freckled Madtom	2	Spotted Gar	34
Freshwater Drum	98	Spotted Sucker	638
Gizzard Shad	80	Striped Mullet	49
Golden Topminnow	2	Tadpole Madtom	1
Grass Pickerel	2	Threadfin Shad	30
Grass Shrimp	267	Warmouth	37
Green Sunfish	12	Weed Shiner	1957
Gulf Menhaden	1	Western Mosquitofish	177
Harlequin Darter	4	White Crappie	53
Hogchoker	7	Yellow Bullhead	3

Creel Survey

In 2007, a recreational angler survey (creel survey) was conducted from January through December on the middle portion of the Calcasieu River to collect effort, catch, and harvest information, particularly for largemouth bass. This survey estimated that a total of 6,695 anglers spent 22,287 hours on the water, of which 15,609 (70%) were expended by bass anglers. Using an estimated surface acreage of 2,800 acres (including Calcasieu West Fork), this works out to approximately 5.5 hours/acre/year effort by bass anglers. This is well below the 30 angler hours/acre/year threshold theorized by Eder (1984) to have significant impacts on largemouth bass size structures. This amount of effort may be even less significant considering the total bass angler release rate of 82.3% (Table 3). The remaining effort was spent predominately by catfish anglers (8.7%), non-specific anglers (8.5%), and bream (*Lepomis spp.*) anglers (6.6%).

2007 creel data indicates the predominant angler type by number was LMB anglers, followed

distantly by non-specific anglers and catfish anglers. Mean fishing trip duration was from 2.2 to 4.7 hours, with anglers traveling between 5 and 11 miles to reach their chosen launch site (Table 1). Bass anglers experienced high catch rates (4.37 bass/trip), but had low harvest rates (1.07 bass/trip, Table 2). This may be due to public perception of the benefits of catch and release on hurricane recovery, or a simple lack of desire to harvest smaller (<12") fish that made up the majority of their catch.

Table 1. Total angler number, averages of angler party size, duration of fishing trip, and distance traveled from residence to boat ramp from 2007 Calcasieu River creel survey.

Target Species	Total # of anglers	Mean # of anglers in party	Mean length of fishing trip (hrs.)	Mean one-way distance traveled to ramp
Largemouth Bass	4585	1.65	3.43	11
Anything	743	2.73	2.20	5
Catfish	443	1.70	4.74	6

Table 2. Largemouth bass caught per trip, released per trip, harvested per trip, and mean weight of harvested bass by bass anglers in 2007 from the Calcasieu River.

LMB Anglers			
# LMB caught per trip	#LMB released per trip	# LMB harvested per trip	Average weight of harvested LMB
4.37	3.29	1.07	0.76

Table 3. Total largemouth bass harvested, released, released below, and released above 12 inches by largemouth bass anglers in 2007 from the Calcasieu River.

LMB Anglers			
Total #LMB harvested	Total #LMB released	#LMB released below 12"	#LMB released above 12"
3745	17411	13977	3434

Commercial

The two species most commonly harvested by commercial fishermen are alligator gar and blue catfish, with mean annual harvests of 29,076 lbs. and 24,861 lbs. respectively. Reported commercial landings (Tables 5-7) are for the entire Calcasieu River basin (including tributaries) and are not waterbody specific. The data is from the LDWF trip ticket program for commercial landings and is reported as total pounds and value per species by year. Data excludes near shore landings in the Gulf of Mexico.

Table 5. Annual reported commercial landings and total value of landings for alligator gar, non-specific gar, longnose gar, and spotted gar from the Calcasieu River basin 1999-2011.

Year	Alligator Gar (Lbs.)	Unclassified Gar (Lbs.)	Longnose Gar (Lbs.)	Spotted Gar (Lbs.)	Total Value
1999	25,914	0	197	57	\$21,949.11
2000	32,494	155	141	38	\$37,310.75
2001	23,424	0	78	0	\$22,394.69
2002	20,896	0	36	7	\$16,320.85
2003	53,325	38	0	111	\$32,189.76
2004	81,946	0	34	0	\$37,081.51
2005	23,182	47	43	0	\$14,216.35
2006	37,381	7,245	272	3	\$38,231.43
2007	18,992	39,733	33	0	\$59,714.94
2008	13,074	16,858	164	12	\$30,570.75
2009	17,509	8,155	0	0	\$38,205.30
2010	8,232	23,416	20	0	\$40,374.40
2011	21,611	37,127	43	0	\$77,477.83

Table 6. Annual reported commercial landings and total value of landings for blue catfish, channel catfish, and flathead catfish from the Calcasieu River basin 1999-2011.

Year	Blue Catfish (Lbs.)	Channel Catfish (Lbs.)	Flathead Catfish (Lbs.)	Total Value
1999	47,953	4,650	496	\$28,672.30
2000	47,929	971	127	\$27,769.55
2001	31,472	2,753	93	\$17,826.70
2002	34,554	15,728	100	\$24,927.50
2003	10,927	1,452	834	\$5,882.88
2004	16,572	3,434	231	\$10,905.88
2005	8,099	1,451	0	\$9,643.64
2006	21,844	1,405	577	\$15,230.68
2007	34,070	0	57	\$19,554.52
2008	21,788	0	1,204	\$14,000.78
2009	4,516	0	115	\$3,249.49
2010	29,140	4,601	790	\$20,240.72
2011	14,325	1,081	858	\$10,216.36

Table 7. Annual reported commercial landings and total value of landings for bowfin, buffalo spp., common carp, and freshwater drum (gaspergou) from the Calcasieu River basin 1999-2011.

Year	Bowfin (Lbs.)	Buffalo (Lbs.)	Common Carp (Lbs.)	Freshwater Drum Gaspergou (Lbs.)	Total Value
1999		4,430	102	1,318	\$1,458.33
2000		2,633	46	550	\$1,354.15
2001	6	2,696	64	1,222	\$1,018.71
2002	4	5,330	24	2,178	\$1,833.65
2003	1,071	9,342	1,033	3,053	\$3,168.50
2004	5	4,034	199	1,819	\$1,297.41
2005	15	4,452	197	803	N/A
2006		10,652	521	686	\$3,562.92
2007	5	2,373	0	602	\$1,881.25
2008		2,036	21	941	\$1,894.70
2009		2,844	20	892	\$1,687.69
2010		2,707	13	187	\$2,220.41
2011		3,314	89	94	\$1,752.45

Species of Special Concern

Paddlefish, *Polyodon spathula*—Paddlefish have been collected in gill nets deployed during standardized big river sampling from 2002-2008 (N=16). State ranking S3: rare and local throughout the state or found locally (even abundantly at some of its locations) in a restricted region of the state, or because of other factors making it vulnerable to extirpation (21 to 100 known extant populations)

Western Sand Darter, *Ammocrypta clara*— has not been collected on the Calcasieu River to date in LDWF big river sampling efforts. State ranking S2: imperiled in Louisiana because of rarity (6 to 20 known extant populations) or because of some factor(s) making it very vulnerable to extirpation.

Bigscale Logperch, *Percina macrolepida*—has been collected with electrofishing during standardized big river sampling from 2002-2011 (N=23). State ranking S1/S2: critically imperiled in Louisiana because of extreme rarity (5 or fewer known extant populations) or because of some factor(s) making it especially vulnerable to extirpation, and/or imperiled in Louisiana because of rarity (6 to 20 known extant populations) or because of some factor(s) making it very vulnerable to extirpation.

HABITAT EVALUATION

Lower 15%: Approximately 26 river miles

This section of the river is estuarine and brackish marsh habitat and is subject to high salinities

(5.0 to 30.0 ppt), this area is not suitable habitat for freshwater fish. For the same reason, nuisance aquatic vegetation is nonexistent.

Substrate—Silt, clay, and sand with occasional oyster reef.

Vegetation—Predominately shoreline oystergrass (*Spartina spp*).

Mid 15%: Approximately 37 river miles

This area transitions from saltwater to freshwater with a wide range of salinities (0.0 to 20.0 ppt.) depending on season and locale. Navigation projects have significantly degraded freshwater habitat below the saltwater barrier by allowing ingress of high salinity water. The habitat evaluation for this portion of the river will concentrate on the area upstream of the saltwater barrier since the area below it has become predominately saline.

Spawning Habitat—

As with most river systems, spawning habitat for many species varies with the spring flood pulse. High water years flood batture areas and increase connectivity with backwater swamps and marshes providing abundant habitat for nest building fish. In low water years, spawning habitat is limited to the main river channel and connected swamps and marshes. In this part of the river, there are abundant river swamps with woody debris that provide adequate spawning area even in low flood pulse years. Overall, spawning habitat is not usually a limiting factor in fisheries production.

Juvenile habitat—

Juvenile habitat for centrarchids also varies with spring rises, with high water years providing good access to flooded batture lands containing abundant woody debris cover. During low water years in the spring season, in addition to reduced flooded vegetation, higher salinities may reach this part of the river and negatively impact juvenile/egg survival of freshwater fish. Lack of juvenile habitat in low water years can reduce recruitment by forcing juvenile fish into the main river channel increasing likelihood of predation.

Adult habitat—

Adult habitat varies by season, with summer and fall having the annual minimum available habitat. This portion of the river has numerous bays and connected oxbows that are excellent habitat for adult largemouth bass. However, this amount of adult habitat is limited to the normal confines of the river, and in many years cannot support the abundance of YOY fish produced during the spring flood pulse. Because of this, adult habitat is a limiting factor of fisheries production in this part of the Calcasieu River.

Fertility—

Because the Calcasieu River is relatively un-impacted/un-impeded for most of the upper watershed (low head dams only), the overall fertility of the system is in a relatively natural state. This means that fertility, and therefore productivity, are dependent upon watershed fertility. Because the overall soil fertility of the Calcasieu River basin is relatively low, fisheries production is lower than more nutrient rich rivers. While this reduced carrying capacity is natural for this area, overall fertility is the primary limiting factor in fisheries production.

Problem Vegetation—

This part of the river is where most problem vegetation occurs. The same open bays and oxbows that provide largemouth bass habitat also provide excellent growing conditions for aquatic vegetation, primarily water hyacinth and *Salvinia spp.* Because this is an open river system, these plants are prone to movement and in most areas do not reach concentrations high enough to impact fisheries. However, because of the number of camps/homes and high usage in the area, when it does accumulate it generates complaints. Giant salvinia (*Salvinia molesta*) has become more common in the area and heavy rains wash it out of private backwater systems and into the main channel. Problem areas are routinely treated by LDWF spray crews, generally on a monthly to bi-monthly basis depending on densities and river conditions.

Substrate

The primary substrates are silt and river sand.

Artificial structure

None

Upper 70%: Approximately 139 river miles

This stretch of river becomes shallower, narrower, with swifter moving current.

Spawning Habitat—

The spring flood pulse can provide additional spawning habitat in this part of the river. However, because of the small batture area and rapid water level fluctuations, the pulse is not as beneficial to nest building fish. The shallow sandy bottom of the river provides ample spawning habitat without the flood pulse. The two low head dams may block spawning migrations for some species in low water years. Overall, spawning habitat is not a limiting factor in this part of the river.

Juvenile habitat—

Juvenile habitat availability varies with water levels. Multitudes of downed trees and inundated terrestrial vegetation provide ample woody debris which is the primary cover available to juvenile fish. Juvenile habitat is not a limiting factor.

Adult habitat—

The entirety of the river (bank to bank) is available as adult habitat. Adult habitat is not a limiting factor.

Fertility—

This part of the Calcasieu contains the two low head dams found on the river. These dams do not impede nutrient movement under most conditions. The overall fertility of the system is in a relatively natural state. This means that fertility, and therefore productivity, are dependent upon watershed fertility. Because the overall soil fertility of the Calcasieu River basin is relatively low, fisheries production is lower than more nutrient rich rivers. While this reduced carrying capacity is natural for this area, overall fertility is the primary limiting factor in fisheries production.

Problem Vegetation—

Due to the swifter currents and sandy substrate, aquatic vegetation is not problematic in this area.

Substrate

Primarily sand.

Artificial structure

None

CONDITION/IMBALANCE PROBLEM

Hydrologic alterations on the mid and lower portions of the river, primarily the Calcasieu Ship Channel, has increased salinities to the point where areas that was once freshwater habitat are now saline and no longer suitable to freshwater fish.

Problem aquatic vegetation in the middle portion of the river, primarily giant salvinia are impeding access and impacting backwater habitats.

Low head dams, while less harmful to stream ecology than reservoir dams, are affecting the natural river flows, especially in low water years.

CORRECTIVE ACTION NEEDED

Where feasible, the natural hydrology of the river should be restored. Because of the importance of the Calcasieu Ship Channel to shipping interests and therefore the local economy, removal of the ship channel is not a viable option. The saltwater barrier is already in place to try and prevent saltwater intrusion further upstream. Other methods to reduce salinities should be examined. Feasibility and public acceptance of removal of the low head dams on the upper portion should be examined.

RECOMMENDATIONS

- 1) Work with DNR and USACE to examine feasibility of putting a lock and dam on the ship channel at Monkey Island. The old river loop at this point will allow smaller traffic and river flows to circumvent the structure.
- 2) Continue LDWF herbicide control efforts on the middle portion of the river.
- 3) Work with private landowners to stock giant salvinia weevils in private backwater areas outside the main channel.
- 4) Protect the relatively natural state of the river in the upper portion. This can possibly be accomplished by partnering with local state legislators to add the Allen parish segment to the scenic streams program.
- 5) Partner with local government to examine feasibility of removing existing low head dams to promote natural river hydrology and prevent blockage of spawning migrations.
- 6) Continue to assess fish stocks with standardized and big river sampling techniques. A largemouth bass age, growth and mortality project will commence from 2012 – 2014.

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